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Public Summary:

Scientific Abstract:
This report presents highlights of discussions that focused on the biology of cancer stem cells as conducted at the fifth Annual Meeting of the International Society for Stem Cell Research, held in Cairns, Australia, June 17-20, 2007. The function of adult stem cells is believed to depend on their niches, that is, the microenvironment in which these stem cells reside. A similar concept applies to understanding the development of cancer, as it is becoming increasingly clear that only a small subset of cancer cell populations is capable of initiating/sustaining tumor formation. These tumorigenic cells, commonly referred to as cancer stem cells, also appear to reside in particular niches, and they bear the known, albeit dysfunctional, stem cell characteristics of self-renewal and differentiation. Dysregulation of stem cell niches is thought to contribute to tumorigenesis by affecting the complex network of signaling interactions that occur between stem cells and their neighboring cells, thus imbalancing the physiological controls on self-renewal and differentiation processes. This hypothesis was widely explored at the conference to shed new light on the mechanisms of tumor origin and progression and to unveil novel antitumor therapeutic approaches.